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ABSTRACT

A study examined the relationship between reading instruction and the development of decoding and spelling skills and the writing fluency of children with varying levels of phonemic awareness. First grade children from two classrooms in a rural Florida school district who began school high and low in phonemic awareness received either whole language or traditional basal instruction. The whole language curriculum included the shared book experience and extensive writing activities; the traditional basal curriculum included explicit phonics instruction, but very little writing. Results show that high phonemic awareness children outperformed low phonemic awareness children; there was no significant difference between instructional approach in the performance of children on any of the measures. Effect sizes indicated that children who started school high in phonemic awareness were at an advantage in the whole language classroom. Children who started school low in phonemic awareness were given an advantage by being placed in the traditional classroom, although the magnitude of that advantage was not as strong as was the advantage to high phonemic awareness children of being in the whole language classroom. Children in the whole language classroom became more fluent writers; children in the traditional classroom became more accurate spellers in their compositions. (Six tables of data and one figure are included; 24 references are attached.) (Author/PRA)

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The effect of phonemic awareness ability and reading instructional approach on first grade children's acquisition of spelling and decoding skills.

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Paper presented at the meeting of the National Reading Conference, November 1990. Miami, Florida

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Abstract

This study examined the relationship between reading instruction and the development of decoding and spelling skills and the writing fluency of children with varying levels of phonemic awareness. First grade children who began school high and low in phonemic awareness received either whole language or traditional basal instruction. The whole language curriculum included the shared book experience and extensive writing activities; the traditional basal curriculum included explicit phonics instruction, but very little writing. High phonemic awareness children outperformed low phonemic awareness children; there was no significant difference between instructional approach in the performance of children on any of the measures. Effect sizes indicated that children who started school high in phonemic awareness were at an advantage in the whole language classroom. Children who started school low in phonemic awareness were given an advantage by being placed in the traditional classroom, although the magnitude of that advantage was not as strong as was the advantage to high phonemic awareness children of being in the whole language classroom. Children in the whole language classroom became more fluent writers; children in the traditional classroom became more accurate spellers in their compositions.

The Effect of Traditional and Whole Language Instruction on High and Low Phonemic Awareness Students' Literacy Development in First Grade

Phonemic awareness is one of several metalinguistic abilities which allows children to reflect on features of spoken language. Specifically, phonemic awareness is an insight into the structure of spoken language, including some ability to manipulate phonemes. For example, students who have developed phonemic awareness can segment and blend phoneme sounds, delete initial and final phonemes from spoken words, and manipulate phonemes to generate new words.

Several correlational studies have identified phonemic awareness as a very powerful predictor of reading achievement in first grade (Juel, 1988; Juel, Griffith, & Gough, 1986; Lomax & McGee, 1987; Stanovich, Cunningham, & Feeman, 1984; Tunmer, Herriman, & Nesdale, 1988). In fact, several studies have indicated it is a better predictor than more global measures such as IQ and general language ability (Juel et al., 1986; Stanovich, 1986; Stanovich et al., 1984). In a longitudinal study of the reading achievement of children after four years of schooling, Juel (1988) found the probability was .88 that a poor reader at the end of first grade would remain so at the end of fourth grade. The children who became poor readers usually entered first grade with little phonemic awareness. Their growth in spelling-sound knowledge was initially slow and they never reached the level of the average and good readers.

Some training studies have linked phonemic awareness causally with reading achievement (Bradley & Bryant, 1983; Lundberg, Frost, & Petersen, 1988). As part of a larger longitudinal study of the relationship between phonemic awareness and later reading achievement, Bradley and Bryant provided training in categorizing sounds to children while they were learning to read. Two experimental groups were taught that the same word (e.g., hen) shared common beginning (e.g., hen, hat), middle (hen, pet), and ending (hen, man) sounds with other words. Children in one of the experimental groups received additional instruction in how sounds represent letters of the alphabet (i.e., the alphabetic principle). One control group received training in categorizing the same words into conceptual categories (e.g., hen is an animal); a second control group received no training. After two years the results of standardized tests of reading and spelling showed that the children who received sound-categorization-only training were 3-4 months ahead of the control group who received conceptual-categorization training. The experimental group who received additional training in the alphabetic principle had an even greater advantage. The researchers concluded that training in sound categorization affects progress in reading and spelling, and that the training is more effective when it also involves an explicit connection with the alphabet.

Lundberg et al. (1988) provided phonemic awareness training to kindergarteners, prior to their receiving formal reading instruction. The training included word, syllable, and phoneme segmentation.

Children in a control group received no training. In this study phonemic awareness training in kindergarten had an effect on spelling achievement at the end of first grade, and on spelling and decoding achievement at the end of second grade.

It appears that an insight into the structure of spoken language and an understanding of the relationship between that structure and written language (i.e., the alphabetic principle) is critical both to early reading success and to later reading achievement, because it results in the child's ability to independently decode words not previously taught through direct instruction. According to Stanovich (1986), the acquisition of some knowledge of spelling-to-sound mappings gives children the reading independence that leads to the levels of practice required for fluent reading and that some minimum level of explicit phonemic awareness is required for the acquisition of that knowledge.

> It is important that phonemic awareness and skill at spelling-to-sound mapping be in place early in the child's development, because their absence can initiate a causal chain of escalating negative side effects. (Stanovich, 1986, pp. 363-364.)

Recent changes in reading instruction have included a movement away from a more traditional skills-based instructional approach (TI) to what has been termed "whole language" instruction (WLI). Typically studies of whole language instruction have focused on its effectiveness for developing readiness skills in kindergarten (Brown, Cromer, & Weinberg,

1986; Ribowski, 1985) and on vocabulary and comprehension achievement at the first grade level (Reutzel & Cooter, in press).

There seems to be a need for in-depth studies of the development of decoding and spelling skills in whole language classrooms, particularly because WLI teachers eschew the teaching of letter-sound correspondences in isolation, believing it violates the principle of whole-to-part instruction characteristic of the whole language tradition. In contrast, the shared book experience is frequently a part of initial reading instruction in whole language classrooms. During a shared book experience children are first introduced to a story by having it read to them by the teacher who reads from an enlarged version of the text. Thus the children become familiar with the whole text first. Later, the children engage in print studies by examining sentences and then words from the text. Children learn phonics skills indirectly through the examination of words with similar spellings (e.g., words beginning with the same consonant or ending with the same phonogram). Included among the techniques used by the teacher during shared book experience readings is pointing to each word as it is being read orally. It is believed that this pointing will indirectly help children induce the concept of word and the understanding that in English printed language is read from left to right.

Some correlational research has shown a relationship between concept of word and phonemic awareness (Morris, 1981, 1983). Morris (1983) has described a relationship in which word consciousness

facilitates a process whereby tacit phonemic knowledge becomes explicit. A stable concept of word frees the child's attentional resources for the analysis of letters within words during oral reading. Then, eventually the child begins to discriminate the succession of phonemes within spoken words, at which point the word is perceived as a sequence of letter-sound correspondences. Whether phonemic awareness is a prerequisite to the acquisition of spelling-sound information, or whether acquisition of the two can occur simultaneously has not been definitively answered.

A second significant characteristic of WLI is the occurrence of an extensive amount of writing. Almost exclusively the writing experiences that children receive involve going from thoughts to print via speech, and the use of invented spelling is encouraged. In WLI classrooms children can be observed slowly articulating words as they attempt to match phonemes with letters.

There is some evidence to suggest that the process of matching phonemes with letters facilitates the growth of word recognition and spelling ability. Clarke (1988) investigated the effects of using invented spelling in first grade classrooms. Children in four classes received reading instruction through a basal reading program as well as supplementary phonics activities. Children in all classrooms engaged in creative writing sessions; however, in two of the classrooms the children were encouraged to invent their spellings. The children in the other classrooms were encouraged to spell correctly. In Clarke's study

children using traditional spelling did not feel restricted to words they knew how to spell, or by their need to find how to spell words they wanted. According to Clarke, they found the correct spelling and copied it or asked someone who knew. Additionally, increases in the percentages of correctly spelled words were evident only for children using traditional spelling. However, children using invented spelling were superior in their spelling and phonic analysis skill, and Clarke concluded they had benefitted from the practice of matching sound segments of words to letters as they wrote and from using their own sound sequence analysis.

As the movement to whole language instruction escalates it is important for us not to ignore important findings about what is critical for learning to read successfully. It may be that instructional components such as the shared book experience and extensive writing that are a part of a whole language program will enable children to develop phonemic awareness but in a different way.

In this study we looked at the intersection of two concepts, phonemic awareness and whole language instruction. Specifically, we were interested in answering the following questions:

1. What is the relationship between instructional approach and the development of decoding and spelling skills of children with varying levels of phonemic awareness?
2. Can children induce letter-sound correspondence information without direct phonics instruction?

3. What is the relationship between instructional approach and the development of the spelling accuracy and writing fluency of children with varying levels of phonemic awareness?

Method

Subjects

The sample included children from two classrooms in a rural school district in Florida. Children in one of the classrooms were taught using whole language instruction (WLI) in which the shared book experience and numerous writing activities played a prominent role. Among the writing activities in the WLI classroom were daily dialogue journals, book innovations, language experience stories, writing that was an outgrowth of unit study, literature responses, and letter writing to story book characters and to peers through a class post office. Children in the other classroom received traditional instruction (TI) from a basal reading program. Writing opportunities beyond those of commercially prepared worksheets were minimal. Children in the TI classroom received structured spelling instruction including weekly tests early on, whereas this was not ever a part of the instruction in the WLI classroom. The reading curriculum included extensive instruction in phonics including exercises from the basal reader as well as supplementary phonics ditto exercises.

Children were individually administered the GKR Phonemic Awareness Test (Roper/Schneider, 1984) at the beginning of the school year. (This oral test contains six subtests: (1) phonemic segmentation, (2)

blending, (3) deletion of first phoneme, (4) deletion of last phoneme, (5) substitution of first phoneme, and (6) substitution of last phoneme. Reliabilities (alpha coefficients) are greater than .7 for all subtests. This test was scored for total number of correct items.) Pretest scores on the phonemic awareness test were used to identify high and low phonemic awareness groups. The six highest and six lowest scoring children in each classroom were targeted as high and low phonemic awareness groups. A one-way ANOVA with planned comparisons using Tukey's HSD indicated that in each classroom the high and low phonemic awareness groups were significantly different. Additionally, there was no significant difference between the two low phonemic awareness groups or the two high phonemic groups in either classroom. Results of this analysis are reported in Table 1.

Insert Table 1 about here

Procedures

All pretesting was conducted in September; posttesting was conducted in April and May. The phonemic awareness test was administered as a posttest to students in the two low incoming phonemic awareness groups.

Spelling. Spelling performance levels for students were obtained using three measures: (1) a spelling features test, (2) spelling in context, and (3) Test of Written Spelling (Larsen & Hamill, 1976). The

spelling features test was patterned after a developmental spelling test described in Temple and Gillet (1984). In May this test was administered to children in groups of three. The spelling features test was used in a qualitative analysis of the children's acquisition of letter-sound correspondence information.

Pre and posttest writing samples were obtained by having the children write a story about pictures depicting a dog climbing on some rocks (September) and a cat on a bookshelf (May). To assess spelling in context the May writing samples were assigned a spelling rating based upon the effect the overall spelling of words in the sample had on the readability of the story. The interrater reliability for absolute agreement among four raters scoring the writing samples was .62.

The Test of Written Spelling (TWS) was administered in a total class setting in May. This test contains separate lists of predictable and unpredicatable words. The reliability of the TWS ranges from .50 to .78 at the first grade level (Mitchell, 1985).

Decoding. In May each child was asked to read 20 nonsense words selected from the Bryant Test of Basic Decoding Skills (Bryant, 1975) which has test reliabilities of .96 for first grade. This test was scored for number correct. In April the school district administered the Comprehensive Test of Basic Skills (CTBS) and the word recognition subtest was used as an additional measure of decoding.

Comprehension. The comprehension subtest of the CTBS served as the measure of comprehension. Comprehension performance was included

because other studies (Juel, Griffith, & Gough, 1986) have shown that at this level decoding ability is a strong predictor of the variance in comprehension scores.

Analysis of the Data

Some data were analyzed quantitatively using a 2 X 2 analysis-of-variance factorial design with phonemic awareness (high, low) and reading instructional approach (WLI, TI) as the independent variables. Analyses compared end-of-the-year achievement on the following variables: nonsense word reading (NSN), Comprehensive Test of Basic Skills word recognition (CTBS-WR) and comprehension (CTBS-Comp) subtests, spelling in context (Sp-Ctx), and the Test of Written Spelling predictable (TWS-P) and unpredictable (TWS-U) words.

The features spelling test and the writing samples were analyzed qualitatively. The features spelling test was scored for the percent of specific word features (i.e., short vowels in three-phoneme words, consonant and vowel digraphs, and consonant blends in initial position) correctly spelled. The writing samples were analyzed for aspects of writing fluency, specifically the relationship among three factors: total number of words written, number of unique words used, and percent of words correctly spelled.

Results

Posttest means and standard deviations of the four phonemic awareness groups are reported in Table 2.

Insert Table 2 about here

On each of the dependent variables the main effect of the phonemic awareness group was significant. High phonemic awareness children outperformed low phonemic awareness children. There was no significant difference between instructional approach in the performance of children on any of the measures; however, a difference in the two groups on ability to spell the unpredictable words of the Test of Written Spelling approached significance. This analysis had the only significant interaction. Children in the WLI classroom who were high in phonemic awareness were better at spelling unpredictable words than were their counterparts in the TI classroom. Table 3 reports results of these two-way ANOVAs. The significant interaction is graphed in Figure 1.

Insert Table 3 and Figure 1 about here

Effect sizes were computed as a post hoc analysis for an additional examination of the comparative value of the two instructional approaches for children with different levels of incoming phonemic awareness. These effect sizes are reported in Table 4. Glass' (1980) formula was used (effect size computed by subtracting the mean of the control group from the mean of the experimental group and dividing this difference by the standard deviation of the control group).

Insert Table 4 about here

A positive effect size indicates an advantage for the experimental condition, which in this study is whole language instruction. The data indicate that, with the exception of nonsense word reading, the children who started school high in phonemic awareness were at an advantage in the WLI classroom. In contrast, the children who started school low in phonemic awareness were given an advantage by being placed in the TI classroom, although the magnitude of that advantage was not as strong as the advantage to high phonemic awareness children of being in the WLI classroom.

Table 5 reports results of the qualitative analysis of the individual word features correctly spelled by the children. High phonemic awareness children in both classrooms were accurate at correctly spelling these specific word parts. Differences between low phonemic awareness children in the TI and WLI classrooms were wider. Children receiving the TI instruction appeared to be more accurate.

Insert Table 5 about here

Word counts related to writing fluency are reported in Table 6. Children in the TI classroom were somewhat stable in the total number of words and the number of unique words they used in their compositions.

That is, the numbers increased less than 25 percent from pretest to posttest. In the WLI classroom high phonemic awareness children had a greater than 25 percent increase in the total number of words used. Low phonemic awareness children more than doubled in the total number and in the number of unique words they used in their compositions. An opposite pattern emerged for percents of words correctly spelled in the compositions. Whereas children in the WLI classroom were somewhat stable in how accurately they spelled the words in their compositions, children in the TI classroom tended to improve in their spelling accuracy.

Insert Table 6 about here

Conclusions

Children who were high in phonemic awareness at the beginning of first grade did well; and children who started first grade low in phonemic awareness achieved at a significantly lower level than children who started high in phonemic awareness. Effect sizes suggest that overall the high phonemic awareness children were at an advantage in the WLI classroom. However, low phonemic awareness children in the TI classroom did slightly better.

Children in the WLI classroom did not receive direct phonics instruction, but overall they appeared able to induce letter-sound correspondence information at a level equal to that of the children who

had received direct instruction in phonics from a basal reading program, as indicated by no significant main effect differences in the means of the two groups on the nonsense word reading task or the word recognition and comprehension subtests of the Comprehensive Test of Basic Skills. Although the nonsense word reading effect size of -2.71 for the high phonemic awareness group indicated a TI advantage, this finding was not supported by the spelling features test analysis. High phonemic awareness children in the two classrooms spelled specific phonic elements about equally. Additionally, the children in the WLI classroom could read nonsense words; there was not a floor effect on this test. However, this test was particularly insensitive to whole language instruction because the children had never experienced meaningless print which required use of only graphophonic cues. The strategy they had been taught, use of a combination of syntactic, semantic, and graphophonic cues, which involved self-monitoring for meaningfulness, could not be used with nonsense words. On the other hand, the TI children had been taught sounds in isolation and were accustomed to using only graphophonic information to sound out words in isolation. Although there was no significant difference in the performance of the high phonemic awareness children in WLI and TI classrooms on comprehension, the effect size of 1.55 favored WLI and indicated that the children's scores on nonsense word reading had no adverse effect on reading text that provides for the use of all the cue systems for decoding.

Saying that children in the two groups appeared to induce letter-sound correspondence information at an equal level means, of course, that children who were low in incoming phonemic awareness achieved at the same low level regardless of whether they received WLI or TI instruction. This study supports the recommendation of researchers such as Juel (1988), Juel et al. (1986), and Lundberg et al. (1988) to provide children low in phonemic awareness with explicit training in hearing sounds in words. Explicit phonemic awareness training did not occur in either of the classrooms. Children in the TI classroom received direct instruction in letter-sound correspondences. However, phonics instruction and phonemic awareness training are not synonymous (cf. Clay, 1979 and Lundberg et al., 1988 for descriptions of phonemic awareness training), as the latter involves hearing sounds in words and occurs in the absence of letters. The modest effect size of -.28 indicated that the TI classroom was not very much more effective than the WLI classroom in enhancing phonemic awareness growth. On the other hand, the writing fluency acquired by the low phonemic awareness children in the WLI classroom is promising, and time may be the critical variable. That is, given enough time these students may indirectly acquire an understanding of the structure as they regularly face the problem of mapping spoken language onto written language.

The shared book experience combined with extensive writing experiences appeared to be very effective for growth in the ability to spell unpredictable words for children who had already developed an

awareness of phonemes. The pointing combined with oral reading that occurs during the shared book experience can provide the opportunity for children to both store the orthographic representations of words in their long term memory and induce letter-sound correspondence information. The shared book experience provides children with the "data," in the form of a voice-print match, which Gough and Hillinger (1980) described as a prerequisite for learning to read. Furthermore, children with phonemic awareness appear to be the best prepared to store orthographic representations of words in this situation because they can focus on a word at the level of the phoneme. Using scatterplots which showed that children low in phonemic awareness tended not to do well on a task requiring them to select the correct spelling of ambiguous phonemes, Griffith (1989) concluded that phonemic awareness is a foundation for the acquisition of information about the spellings of specific words. Perhaps as children are exposed to the voice-print match that occurs during the shared book experience they are able to store the spellings of equivocal phonemes in unpredictable words, if they have the ability to focus on a word at its phonemic level. This finding has implications for further investigation, particularly an investigation into the longitudinal effects of voice-print match on spelling development. At least two studies (Griffith, 1989; Juel, Griffith, & Gough, 1986) have suggested that spelling may change from being a process relying primarily upon phonological information to one relying upon stored orthographic images at about second or third grade.

Other studies have tied the storage of orthographic information to exposure to print in both children (Juel, Griffith, & Gough, 1986) and adults (Stanovich & West, 1989). The relationship among these factors (phonemic awareness, the indirect acquisition of spelling information, and early reading instruction) warrants further study under experimental conditions.

Children in the WLI classroom wrote more words and used more unique words in their compositions than did the children in the TI classroom. However, they seemed to be less concerned about spelling words correctly. Children in the WLI classroom were engaged daily in multiple writing experiences involving the production of extended pieces of text (e.g., journals, letters to classmates, stories, reports), and they were encouraged to invent spellings. These kinds of activities appeared to be very effective for developing writing fluency, particularly among low phonemic awareness children. The pretest composition of one of the low phonemic awareness children is a good example of how fluent these children became. At the beginning of the year this child demonstrated no understanding of the alphabetic principle. Jug was spelled Irdavtefe; ladder was gwumnolie. At the end of the year he produced the following composition.

I hav a kat hu loks tus	(I have a cat who looks just)
lik the won tas on the wol	(like the one that's on the wall)
and se is havn babes bot	(and she is having babies but)
see dit hav tamm yat	(she didn't have them yet)
the kas name is tog	(the cat's name is tog)
and sey liks tu play wit	(and she likes to play with)
my see jops on my and	(me she jumps on me and)
see jops on my brotr to	(she jumps on my brother too)
and sey is keut	(and she is cute.)

That the percentage of spelling accuracy favored TI may have been because students in the TI classroom used fewer different words in their compositions. Since WLI students used more unique words, some of which might have been less common words, there was a greater chance for misspellings. The trade-off between spelling accuracy and writing fluency is a logical one. A fluent writer's goal is to get ideas down on paper and this involves experimenting with words to express thoughts. First grade children generally have not stored the spellings of many words, so their experimentation with ideas on paper would require them to invent more spellings. The fact that the greatest fluency gain was made by the low phonemic awareness students could be interpreted as growth in written language development.

WLI fosters fluent writing but this may be at the expense of spelling accuracy. However, since spelling development is unidirectional (Temple & Gillet, 1984), it is likely that in WLI

classrooms children's spelling accuracy may take longer but in the process they may have attained greater language development. If teachers are accepting of invented spellings and are willing to wait, the long term benefit may be both spelling accuracy as well as writing fluency. In addition, the integration of reading and writing may result in more in-depth processing of information both about the writing system and general knowledge.

The small sample size (i.e., N = 24) is an important caveat of this study, and we would like to see our findings replicated in studies with a larger sample size. However, we believe our study is a good beginning at answering some of the questions educators may have related to achievement differences in WLI and TI classrooms. Additionally, our study is one of the first to look at the impact of different kinds of instruction on the achievement of children with varying levels of incoming phonemic awareness.

References

Bradley, L., & Bryant, P. E. (1983). Categorizing sounds and learning to read - a causal connection. Nature, 301, 419-421.

Brown, M. H., Cromer, P. S., & Weinberg, S. H. (1986). Shared book experiences in kindergarten: Helping children come to literacy. Early Childhood Research Quarterly, 1, 397-405.

Bryant, N. D. (1975). Diagnostic test of basic decoding skills. New York: Columbia University, Teachers College.

Clarke, L. K. (1988). Invented versus traditional spelling in first graders writing: Effects on learning to spell and read. Research in the Teaching of English, 22, 281-309.

Clay, M. (1979). The early detection of reading difficulties. (3rd edition). Portsmouth, NH: Heinemann.

Glass, G. V. (1980). Summarizing effect sizes. In R. Rosenthal (Ed.). New directions for methodology of social and behavioral science: Quantitative assessment of research domains. San Francisco: Jossey-Bass.

Gough, P. B., & Hillinger, M. L. (1980). Learning to read: An unnatural act. Bulletin of the Orton Society, 30, 179-196.

Griffith, P. L. (1989). The relationship between phonemic awareness and spelling ability among children in first and third grade. Paper presented at the National Reading Conference, Austin, TX.

Juel, C., Griffith, P. L., & Gough, P. B. (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. Journal of Educational Psychology, 78, 243-255.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. Journal of Educational Psychology, 80, 437-447.

Larsen, C., & Hammill, D. D. (1976). Test of Written Spelling. San Rafael, CA: Academic Therapy.

Lomax, R. G., & McGee, L. M. (1987). Young children's concepts about print and reading: Toward a model of word reading acquisition. Reading Research Quarterly, 22, 237-256.

Lundberg, I., Frost, J., & Petersen, O. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. Reading Research Quarterly, 23, 263-284.

Mitchell, J. V. (1985). The ninth mental measurements yearbook. Lincoln, NE: The University of Nebraska Press.

Morris, D. (1981). Concept of word: A developmental phenomenon in the beginning reading and writing processes. Language Arts, 58, 659-668.

Morris, D. (1983). Concept of word and phoneme awareness in the beginning reader. Research in the Teaching of English, 17, 359-373.

Ribowsky, H. (1985). The effects of a code emphasis approach and a whole language approach upon emergent literacy of kindergarten children. (Report No. CS-008-397). (ERIC Document Reproduction Service No. ED 269 720).

Reutzel, D. R., & Cooter, R. B. (in press). Whole language: Comparative effects on first grade reading achievement. Journal of Educational Research.

Roper/Schneider, H. D. W. (1984). Spelling, word recognition, and phonemic awareness among first grade children. Unpublished doctoral dissertation, University of Texas at Austin.

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. Reading Research Quarterly, 21, 360-406.

Stanovich, K. E., Cunningham, A. E., & Freeman, D. J. (1984). Intelligence, cognitive skills, and early reading progress. Reading Research Quarterly, 19, 120-139.

Stanovich, K. E., & West, R. F. (1989). Exposure to print and orthographic processing. Reading Research Quarterly, 24, 402-433.

Temple, C., & Gillet, J. W. (1984). Language arts learning processes and teaching practices. Boston: Little, Brown, and Co.

Tunmer, W. E., Herriman, M. L., & Nesdale, A. R. (1988). Metalinguistic abilities and beginning reading. Reading Research Quarterly, 23, 134-158.

Table 1

Results of Tukey's HSD for the Phonemic Awareness Pretesting

Phonemic Awareness Group	WLI Low	TI Low	WLI High	TI High
Mean	11.5	12.17	37.17	38.67
		*		*

Note. A line is drawn between those groups which do not differ significantly from one another.

*p > .05

Table 2

Means and Standard Deviations for Posttests Administered in April and May

	Phonemic Awareness Group			
	Low		High	
Posttest Measure	TI	WLI	TI	WLI
Phonemic Awareness	31.83 (4.88)	29.83 (8.77)		
NSN	8.33 (4.41)	6.60 (3.21)	17.17 (1.17)	14.00 (4.05)
CTBS-WR	26.60 (2.07)	26.50 (3.15)	29.40 (.55)	30.00 (0.00)
CTBS-Comp	19.20 (3.11)	17.00 (3.41)	23.20 (.84)	24.50 (.84)
Sp-Ctx	3.17 (.75)	3.05 (.72)	3.50 (.84)	3.96 (.10)
TWS-P	8.75 (3.10)	8.50 (3.39)	16.25 (3.59)	18.00 (.89)
TWS-U	.50 (.84)	.50 (.84)	1.50 (.84)	4.00 (2.00)

Note. Standard deviations are reported in parentheses.

Table 3

Analyses-of-Variance on Posttest Measures

Posttest Measure	Phon. Awr. (pa)	Instruction (i)	pa X i	Within
NSN				
df	1	1	1	19
MS	380.49	35.34	2.94	11.97
F	31.80***	2.95	.25	
CTBS-WR				
df	1	1	1	18
MS	55.68	.34	.67	3.77
F	14.761**	.09	.18	
CTBS-Comp				
df	1	1	1	18
MS	192.05	1.11	16.71	5.73
F	33.53***	.19	2.92	
Sp-Ctx				
df	1	1	1	19
MS	2.11	.20	.43	.44
F	4.76*	.44	1.06	
TWS-P				
df	1	1	1	16
MS	378.450	2.70	4.80	8.062
F	46.94***	.335	.595	
TWS-U				
df	1	1	1	18
MS	30.817	6.67	8.33	1.67
F	18.490***	4.00°	5.00*	

°p = .06 *p < .05 **p < .01 ***p < .001

Table 4

Effect Sizes

Posttest Measure	Phonemic Awareness Group	
	Low	High
Phonemic Awareness	-.27*	
NSN	-.39	-2.71
CTBS-WR	-.05	1.09
CTBS-Comp	-.71	1.55
Sp-Ctx	-.16	.55
TWS-P	-.08	.49
TWS-U	0	2.25

*This effect size was computed using a gain score.

Table 5

Percent of Word Features Correctly Spelled

	Short Vowels	Digraphs	Consonant Blends
Low Phonemic Awareness			
TI	90	53	72
WLI	50	12	39
High Phonemic Awareness			
TI	97	76	87
WLI	93	74	94

Table 6

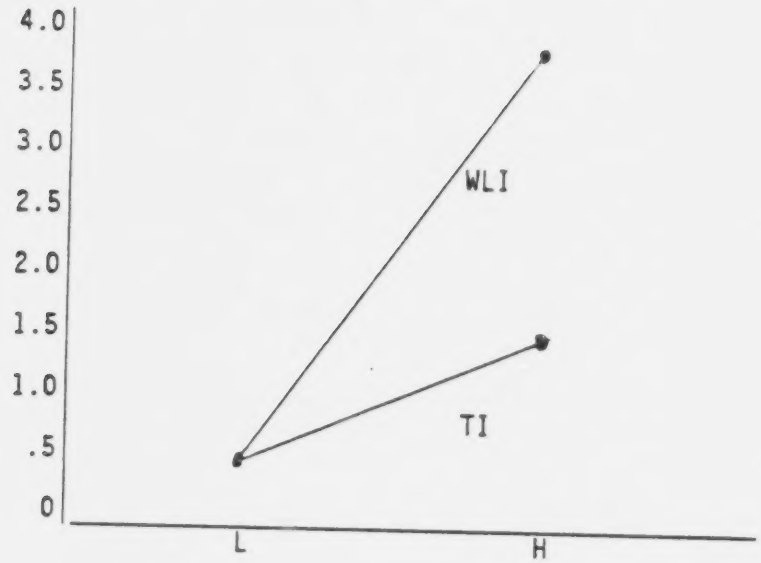
Word Counts of Writing Fluency

Group	Total No. of Words Written		No. of Unique Words Written		% of Total Words Correctly Spelled	
	Pre	Post	Pre	Post	Pre	Post
TI						
High Phon. Awr.	28.3	25.5	18.00	18.33	69.5	85.2
Low Phon. Awr.	21.3	25.5	16.17	17.00	54.3	74.0
WLI						
High Phon. Awr.	25.2	32.3	17.0	20.67	80.8	89.7
Low Phon. Awr.	18.4	37.6	9.2	22.60	49.6	57.0

Note. Numbers reported are averages.

Figure Caption

Figure 1. Interaction between level of phonemic awareness and instructional approach on ability to spell unpredictable words.


4.0
3.5
3.0
2.5
2.0
1.5
1.0
.5
0
WLI
TI
L
H